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USNIC ACID ENANTIOMERS IN LICHENS IN EUROPE AND AFRICA

Uzneasav enatiomerek európai és afrikai zuzmókban

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Both (+)- and (-)-usnic acid (UA) enantiomers occur in lichens naturally. Some lichens produce (+)- , others (-)-form and a few of them contains both. *Cladonia foliacea* (Huds.) Willd. was known to produce (-)-UA, but it was not known if this character is widely distributed in its populations and also the produced amount was little known. Another species *Flavoparmelia caperata* (L.) Hale produces (+)-UA with less known quantitative relations. We aimed to fill in the above knowledge gaps. About 30–30 samples of the two species were collected in Central and Southern Europe, and *F. caperata* also from East Africa. The presence and contents of (-)-UA were determined in *C. foliacea* from Europe using a chiral chromatographic method described earlier and analysed by HPLC-PDA. The content shows a substantial variation (4.08–34.27 mg/g dry weight). Since the (-)-UA enantiomer may have higher bioactive (e.g., bactericide, fungicide, anticancer, insecticide) potential or radiation filtering role, than the (+)-UA, the application of the extracted (-)-UA or crude extracts from the investigated populations may lead to promising results in further studies testing its role. In case crude extract is used, the potential bioactivity of the fumarprotocetraric acid (1.44–9.87 mg/g dry weight), produced also by this species, cannot be neglected.

Since the production of UA, – as other physiological activites – , is influenced by the environmental conditions, we supposed that the macroclimatically different temperature, radiation and humidity in European continental and African tropical habitats resulted in difference in the concentrations measured in the specimens. The content of (+)-UA shows a substantial variation in both continents (5.08–26.43 mg/g – Europe; 6.15–23.54 mg/g – Africa), however, its comparison did not result in significant differences. This can be explained by supposing that the microclimatic conditions of the natural habitats are similar in both continents and most probably consistent with the specific niche requirements of *F. caperata*. The known concentrations support considerations on further investigations and applications of this species in various geographic regions.

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